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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHU, CHRIS C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 07/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/929,350

Applicant(s)

ELDRIDGE ET AL.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 183 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37 - 44, 60, 62 - 72, 88 - 117, 119 - 128, 130 and 131 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 1 - 36, 45 - 59, 61, 73 - 87, 118, 129 and 132 - 183.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on April 18, 2003 has been received and entered in the case.

Information Disclosure Statement

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

3. The information disclosure statement filed April 18, 2003 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 37 ~ 44, 60, 62 ~ 65, 68 ~ 71, 88 ~ 102, 105 ~ 117, 119 ~ 124, 127, 128, 130 and 131 are rejected under 35 U.S.C. 102(b) as being anticipated by Bloom.

Regarding claim 37, Bloom discloses in Fig. 4, Fig. 5, column 1, lines 7 ~ 21 and column 8, lines 21 ~ 40 a semiconductor package comprising:

- a hermetically sealed enclosure (80 and 70) surrounding said package;
- a semiconductor chip (any component on area 60) within said enclosure;
- a first gas within said enclosure; and
- a source of releasable hydrogen (30) within said enclosure.

Further, the limitation “said releasable hydrogen capable of pressurizing the space within said enclosure to a pressure above the pressure associated with said first gas” has been held that the recitation that an element is “capable of” performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

Regarding claims 38, 63, 89, 100, 113 and 122, since Bloom discloses in Fig. 4 air in space (65), said first gas comprises helium.

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Regarding claims 39, 64, 90, 101, 114 and 123, since Bloom discloses in Fig. 4 air in space (65), said first gas comprises hydrogen.

Regarding claims 40, 65, 91, 102, 115 and 124, since Bloom discloses in Fig. 4 air in space (65), said first gas comprises a mixture of helium and hydrogen.

Regarding claims 41, 68, 92, 105, 116 and 127, Bloom discloses in Fig. 4 and column 8, lines 21 ~ 40 said source of releasable hydrogen being a metal hydride.

Regarding claims 42, 69, 93, 106, 117 and 128, Bloom discloses in Fig. 4 and column 8, lines 21 ~ 40 said metal hydride being titanium hydride.

Regarding claims 43 and 70, Bloom discloses in Fig. 4 said package further comprising at least one heat source (25) for heating the source of releasable hydrogen so as to effect the release of hydrogen.

Regarding claims 44 and 71, Bloom discloses in Fig. 4 said package further comprising a plurality of heat sources (25) for heating the source of releasable hydrogen so as to effect the release of hydrogen.

Regarding claim 60, Bloom discloses in Fig. 4 further comprising a substrate (20), wherein said chip is attached to the substrate. Further, as to the language on line 2 of claim 60, the phrase “with a controlled collapse chip connection” is product-by-process claim language. Even though product-by-process claim is limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A

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“product by process” claim is directed to the product per se, no matter how actually made, In re Hirao, **190 USPQ 15 at 17** (footnote 3). See also In re Brown, **173 USPQ 685**; In re Luck, **177 USPQ 523**; In re Fessmann, **180 USPQ 324**; In re Avery, **186 USPQ 116**; In re Wertheim, **191 USPQ 90** (**209 USPQ 254** does not deal with this issue); and In re Marosi et al., **218 USPQ 289** final product per se which must be determined in a “product by, all of” claim, and not the patentability of the process, and that an old or obvious product, whether claimed in “product by process” claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Regarding claim 62, Bloom discloses in Fig. 4, Fig. 5, column 1, lines 7 ~ 21 and column 8, lines 21 ~ 40 a semiconductor package comprising:

- a hermetically sealed enclosure (80 and 70) surrounding said package;
- a semiconductor chip (any component on area 60) within said enclosure;
- a source of releasable hydrogen (30) within said enclosure; and
- a gas at an elevated pressure within said enclosure,
- said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen, and wherein said first gas component is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

Regarding claim 88, Bloom discloses in Fig. 4, Fig. 5, column 1, lines 7 ~ 21 and column 8, lines 21 ~ 40 a semiconductor chip comprising:

- a hermetically sealed enclosure (70 and 80) surrounding said chip;

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- an integrated circuit (any components on 21) within said enclosure;
- a gas at a first pressure within said enclosure; and
- a source of releasable hydrogen (30) within said enclosure.

Further, the limitation “said releasable hydrogen capable of pressurizing the space within said enclosure to a pressure above the first pressure” has been held that the recitation that an element is “capable of” performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

Regarding claims 94, 107, 119 and 130, Bloom discloses in Fig. 4 said chip further comprising at least one heat source (24) for heating the source of releasable hydrogen so as to effect the release of hydrogen.

Regarding claims 95 and 108, Bloom discloses in Fig. 4 said chip further comprising a plurality of heat sources (24) for heating the source of releasable hydrogen so as to effect the release of hydrogen.

Regarding claims 96 and 109, Bloom discloses in Fig. 4 and column 8, lines 21 ~ 40 said source of releasable hydrogen being at least one surface location of a layer of metal hydride.

Regarding claims 97 and 110, Bloom discloses in Fig. 4 and column 8, lines 21 ~ 40 said source of releasable hydrogen being a plurality of surface location of a layer of metal hydride.

Regarding claims 98, 111, 120 and 131, Bloom discloses in Fig. 4 and column 8, lines 21 ~ 40 further comprising a heater (any components on area 60) and associated heater circuitry (40).

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Regarding claim 99, Bloom discloses in Fig. 4, Fig. 5, column 1, lines 7 ~ 21 and column 8, lines 21 ~ 40 a semiconductor chip comprising:

- a hermetically sealed enclosure (70 and 80) surrounding said chip;
- an integrated circuit (any components on 21) within said enclosure;
- a source of releasable hydrogen (30) within said enclosure; and
- a gas at an elevated pressure within said enclosure,
- said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen, and wherein said first gas component is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

Regarding claim 112, Bloom discloses in Fig. 4, Fig. 5, column 1, lines 7 ~ 21 and column 8, lines 21 ~ 40 a semiconductor chip comprising:

- a hermetically sealed enclosure (70 and 80) surrounding said chip;
- a gas at a first pressure within said enclosure; and
- a source of releasable hydrogen (30) within said enclosure.

Further, the limitation “said releasable hydrogen capable of pressurizing the space within said enclosure to a pressure above the first pressure” has been held that the recitation that an element is “capable of” performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

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Regarding claim 121, Bloom discloses in Fig. 4, Fig. 5, column 1, lines 7 ~ 21 and column 8, lines 21 ~ 40 a semiconductor chip comprising:

- a hermetically sealed enclosure (70 and 80) surrounding said chip;
- a source of releasable hydrogen (30) within said enclosure; and
- a gas at an elevated pressure within said enclosure,
- said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen, and wherein said first gas component is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 66, 67, 103, 104, 125 and 126 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloom in view of Han et al.

Bloom discloses the claimed invention except for the gas comprising helium and from about 5% to about 10% hydrogen. However, Han et al. discloses in column 3, lines 59 ~ 67 a gas

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comprising helium and from about 5% to about 10% hydrogen. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Bloom by using the gas as taught by Han et al. The ordinary artisan would have been motivated to modify Bloom in the manner described above for at least the purpose of providing safety (column 3, lines 66 and 67).

8. Claim 72 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bloom in view of Polak et al.

Bloom discloses the claimed invention except for said gas having a pressure of from about 5 MPa to about 50 Mpa. However, Polak et al. discloses in Fig. 1B and column 4, lines 52 ~ 54 a gas (35) having a pressure of from about 5 MPa to about 50 Mpa. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Bloom by using the range of pressure of the gas as taught by Polak et al. The ordinary artisan would have been motivated to modify Bloom in the manner described above for at least the purpose of preventing the power steering fluid from diffusing through bond pad platform (column 4, lines 55 and 56).

Response to Arguments

9. Applicant's arguments filed on April 18, 2003 have been fully considered but they are not persuasive.

On page 53, applicant argues “there is no teaching or suggestion whatsoever in Bloom of Applicant’s claimed ‘source of releasable hydrogen within said enclosure, *said releasable hydrogen capable of pressurizing the space within said enclosure to a pressure above the pressure associated with said first gas.*’ The claims dependent from claim 37 are allowable along with claim 37, and on their own merits.” This argument is not persuasive. Bloom discloses in Fig. 4, Fig. 10, column 5, lines 36 ~ 49, column 6, lines 51 ~ 57 and column 8, lines 24 ~ 33 the element (30) containing titanium hydride for a via fill composition and the via fill composition being formed a small mound or dome above the via opening. Note applicant’s own specification, page 16, lines 4 ~ 5 applicant uses titanium hydride for a source of releasable hydrogen. Since Bloom and applicant use a same material (titanium hydride), Bloom has a source of releasable hydrogen. Furthermore, Bloom clearly shows in Fig. 4 the element (30) located inside of an enclosure (70 and 80). Thus, Bloom discloses a source of releasable hydrogen (30) and the source of releasable hydrogen (30) is within said enclosure (inside of 70 and 80).

Further, applicant argues “there is no teaching or suggestion whatsoever in Bloom of Applicant’s claimed ‘*said releasable hydrogen capable of pressurizing the space within said enclosure to a pressure above the pressure associated with said first gas*’ The claims dependent from claim 37, 88 and 112 are allowable along with claim 37, 88 and 112 and on their own merits.” This argument is not deemed to be persuasive since they are directed to more functional difference rather than pointing out how the claimed invention structurally distinguish over Bloom. Furthermore, Bloom anticipates Applicant’s claims 37, 88 and 112, as amended (see above paragraph five).

For the above reasons, the rejection is maintained.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu
Examiner
Art Unit 2815

c.c.
July 9, 2003



EDDIE LEE
SUPERVISORY PATENT EXAMINER
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